U.S. AIR FORCE

NETWORKING WEAPONS:

Weapons Data Link Network Advanced Concept Technology Demonstration

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NETWORKING WEAPONS

- Evolutionary Improvements to Weapons Have Increased Precision Strike Capability in One-on-One Engagements
- Networked Weapons Provides Opportunity for Revolutionary Improvements in Warfighting Capability
- Key to Successful Integration is Interoperability

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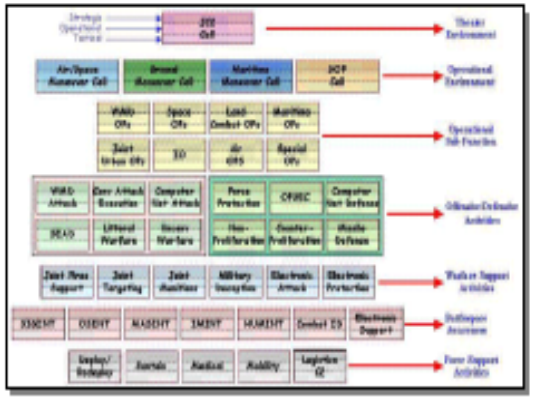
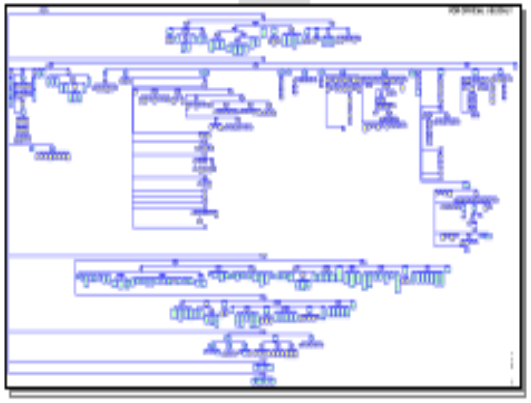
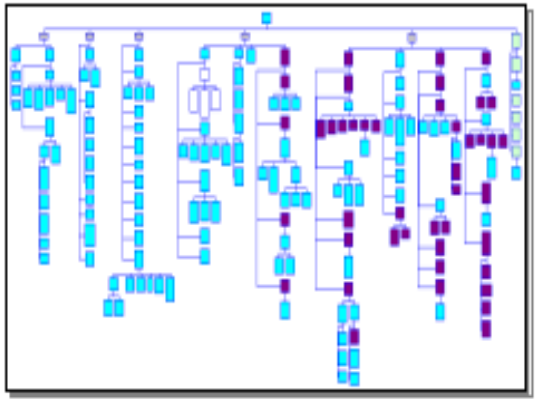
DoD ARCHITECTURE VISION

JFCOM/J8 & DISA







Navy
FORCEnet

Air Force
C2 Constellation

Army
LandWarnet

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WAY FORWARD

- Long Term Need to Drive to End State
- Requirements for Interoperable Networked Weapons Capability Exist Today
- Effort Needed Now to Achieve Desired Fielding Dates (FY10/FY11 Timeframe)
- Joint AF/Navy Weapons Data Link Network ACTD Serves as Pathfinder for Spiraled Network Capability

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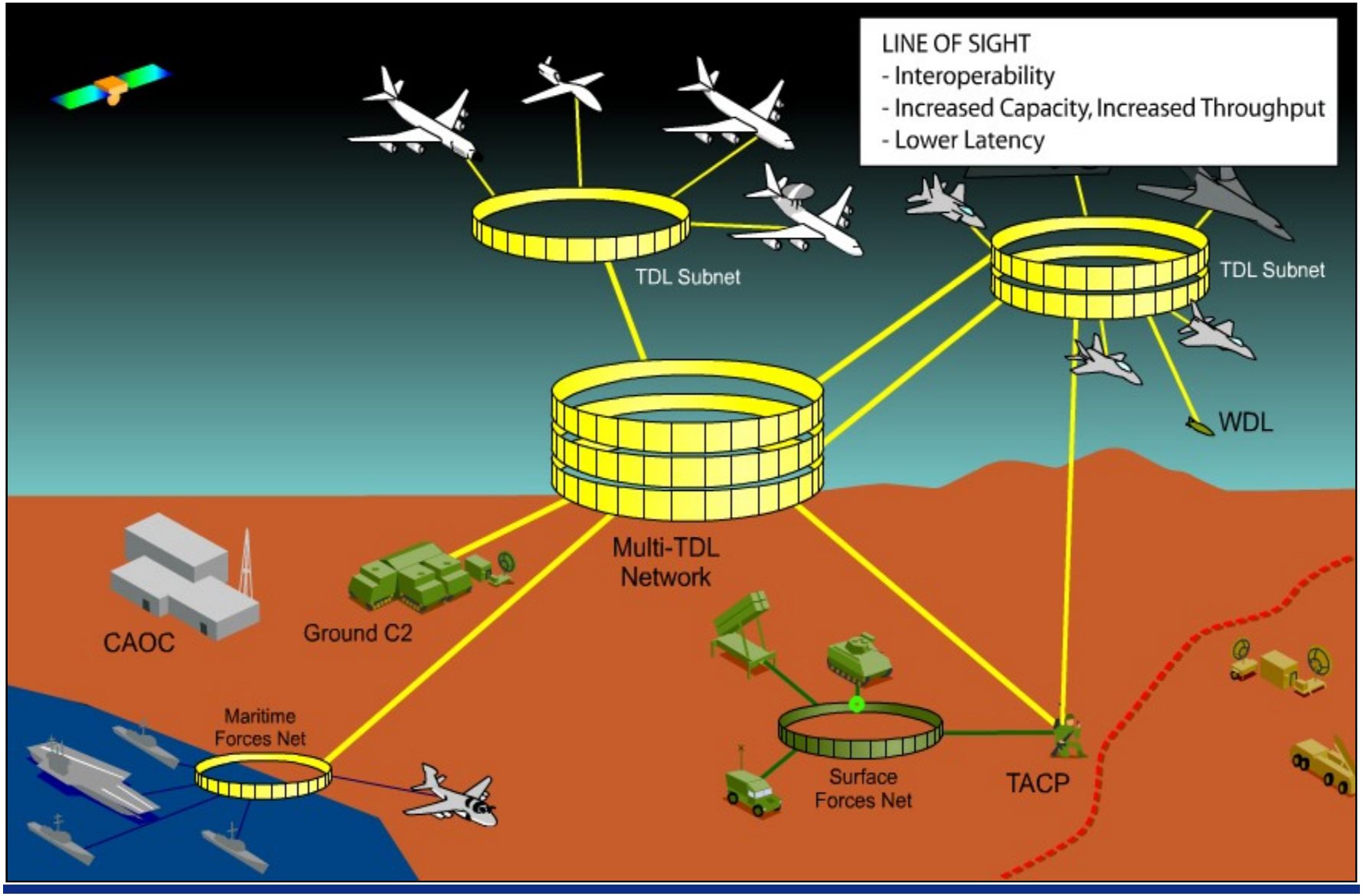
GROWTH TO NET-CENTRIC WARFARE



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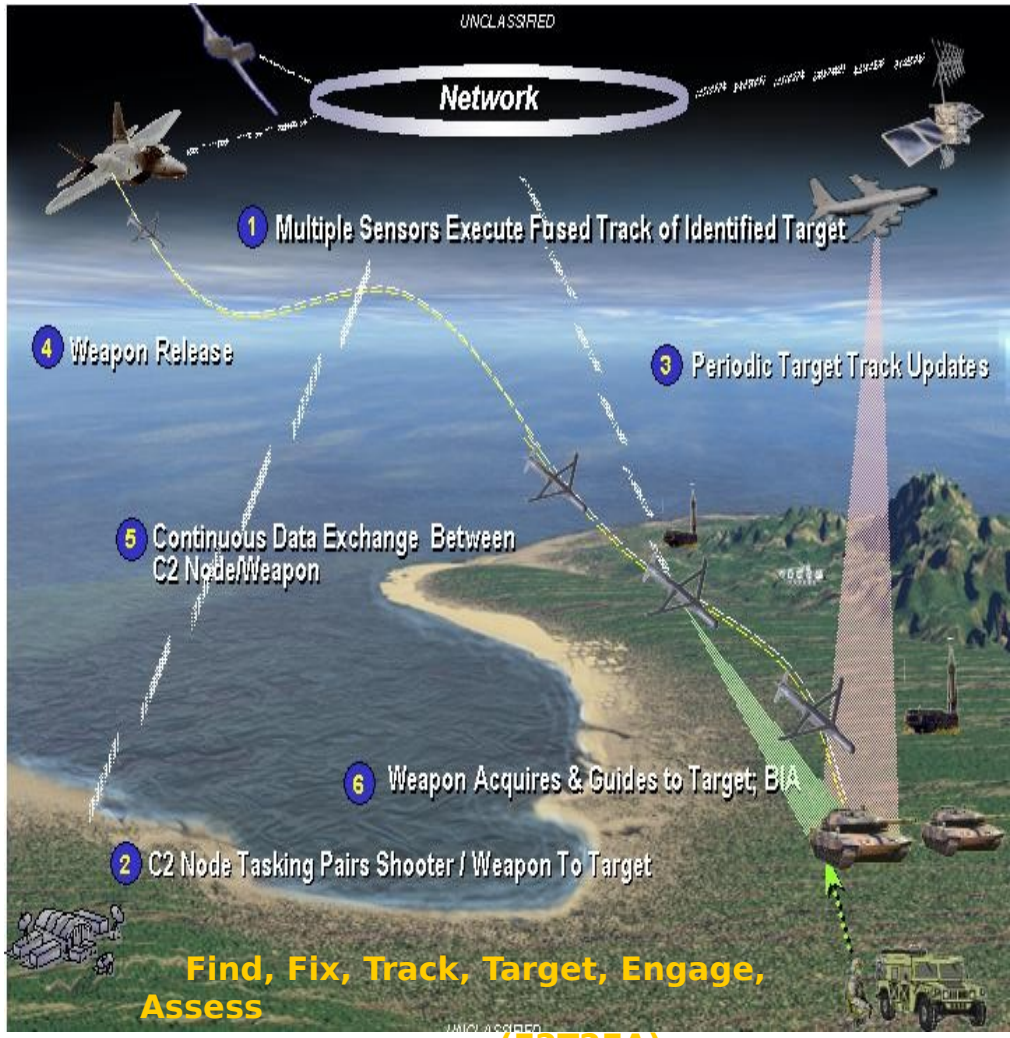
WEAPONS DATA LINK NETWORK (WDLN) ACTD

- FY05 Joint Forces Command Sponsored ACTD Program
- AF/USN Led with USA Participation
- Sets Stage for Weapon Integration into Network Centric Warfare


UNCLASSIFIED
Network
1 Multiple Sensors Execute Fused Track of Identified Target
4 Weapon Release
3 Periodic Target Track Updates
5 Continuous Data Exchange Between C2 Node/Weapon
6 Weapon Acquires & Guides to Target; BIA
2 C2 Node Tasking Pairs Shooter / Weapon To Target
Find, Fix, Track, Target, Engage, Assess
UNCLASSIFIED

(F2T2EA)

Pathfinder for Network-Enabled Weapons Capability

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NETWORKED WEAPONS DESIRED CAPABILITIES

- **Weapon In-Flight Target Update**
  - Key for Time Sensitive and Moving Targets
  - Key Enabler for AF/Navy Maritime Interdiction Role
- **Weapon Retargeting**
  - Importance Increases With Standoff
  - Receipt Compliant Message
- **Weapon In-Flight Tracking**
  - Strike De-confliction and Synchronization
  - CNN Factor
- **Weapon Bomb Impact Assessment (BIA)**
  - Health, Arming Status, Location, Tgt Acquisition, etc.
  - Input to Post-strike Battle Damage Assessment
- **Weapon Abort**

WDLN ACTD DESCRIPTION

- Develops Standard Architectural Framework Supporting Current/Future Weapons Needs (2010, ~2020)
- Develops Common Network Interface/Message
- Identifies C2 and Aircraft Infrastructure Modifications
- Risk Reduction for Pathfinder Weapons
- Demonstrates LOS/BLOS Network Communication
- Establishes Initial Joint Concept of Employment for Networked Weapons

PATHFINDER WEAPONS

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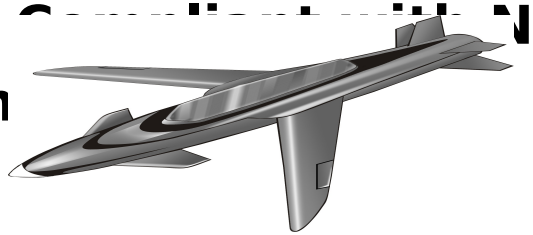
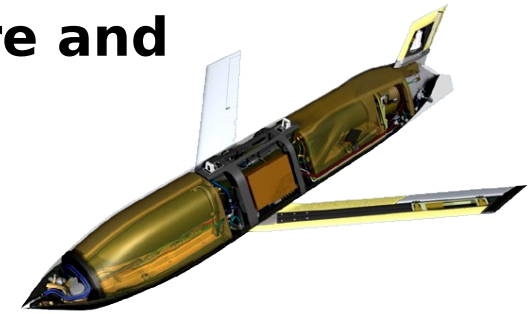
- Initial Networked Design Concepts Developed and Demonstrated
- Compliant with Network Architecture and Interface Standard



Small Diameter Bomb II



Joint Air-to-Surface Standoff Missile

Joint Standoff Weapon

Miniature Air Launched Decoy - Jammer

Wind Corrected Munitions Dispenser – Extended Range

(Not Demonstrated)

WDLN ACTD DELIVERABLES

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- **Network Architecture (System of Systems Approach)**
  - **Weapons/Network Architecture Standards w/ Integration Plans**
  - **Interface Control Document (ICD), Standard Messages, CONOPS**
- **M&S Studies**
  - **Demos Provides Data for Network Loading Analysis**
  - **Feeds Weapon Requirements and Specification Development**

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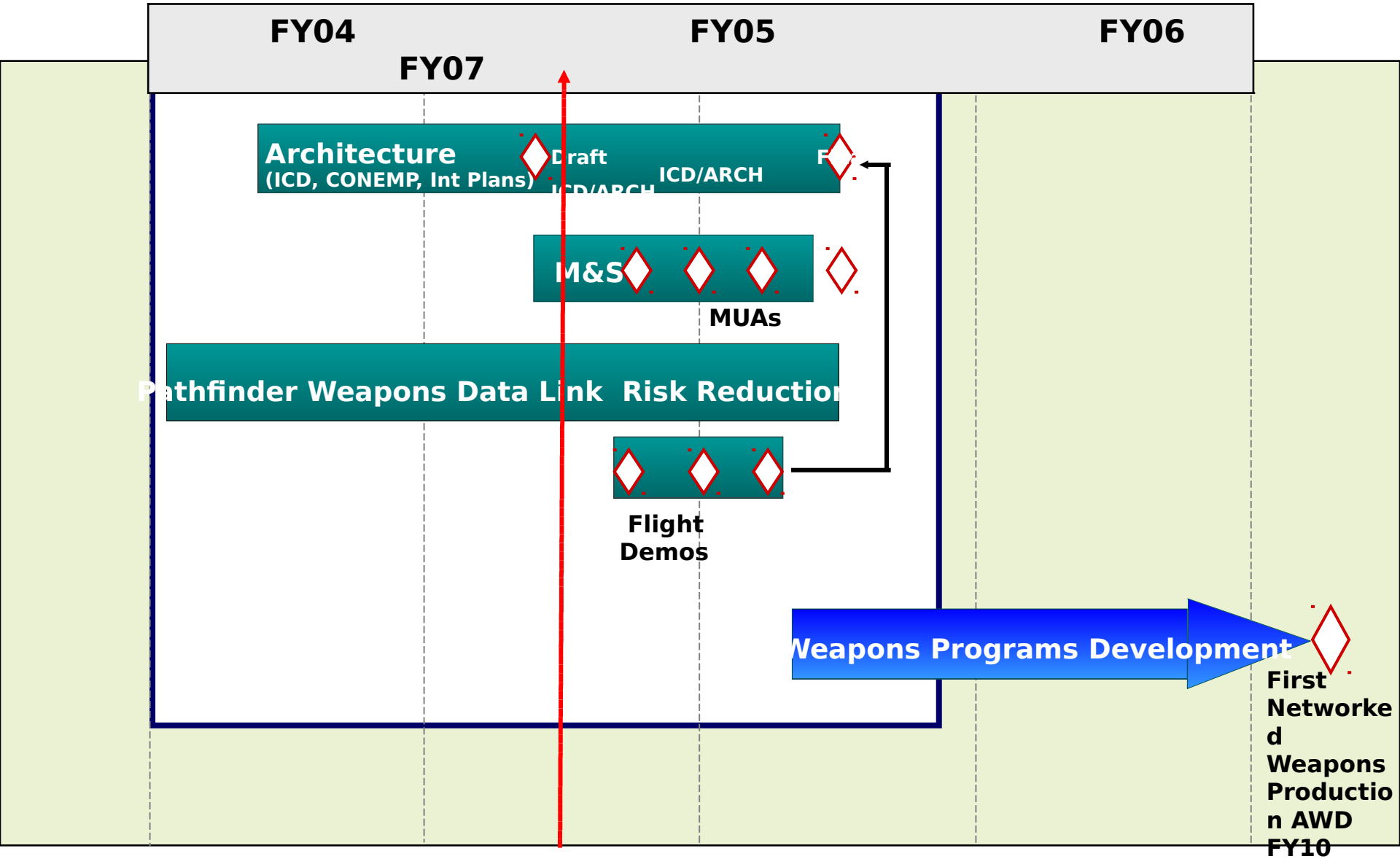
WDLN ACTD SCHEDULE



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CHALLENGES WITH NETWORKING WEAPONS

- **Maintaining Interoperability Relies on Strict Adherence to Standards**
  - **Must Enforce in Contracts**
  - **Critical to Maintain Configuration Control**
- **Network "Ownership" of the Weapon**
- **Handling the Volume**
  - **Load on the Network**
  - **Load on the Operator**
- **Funding Modifications to C2 Infrastructure**
  - **Traditional Weapons Communication: Aircraft & Wpn**
  - **Networked Weapons Communication: Aircraft, Wpns and C2 Nodes**

Networking Weapons Requires Paradigm

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SUMMARY

- WDLN ACTD is a Joint Pathfinder for Net-Enabled Weapons
- Supports Near-Term Development of Weapons Capability
  - Weapon Systems Risk Reduction
  - Networks Interface Standard – Common Across Weapons
  - Network Loading Assessment and CONEMP
- Provides Path for GIG Integration